ZooKeys 9: 27-46 (2009)
doi: 10.3897/zookeys.9.180
www.pensoftonline.net/zookeys

RESEARCH ARTICLE

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Review of the *Acontia areli* group with descriptions of three new species (Lepidoptera, Noctuidae, Acontiinae)

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Academic editor: *B. Christian Schmidt* | Received 23 March 2009 | Accepted 23 April 2009 | Published 12 May 2009

urn:lsid:zoobank.org:pub:B6371F8A-0C34-414B-94F3-F05378119 4A2

Citation: Ferris CD, Lafontaine JD (2009) Review of the *Acontia areli* group with descriptions of three new species (Lepidoptera, Noctuidae, Acontiinae). In: Schmidt BC, Lafontaine JD (Eds) Contributions to the Systematics of New World Macro-Moths. ZooKeys 9: 27-46. doi: 10.3897/zookeys.9.180

Abstract

The six-species of the *Acontia areli* group are examined. In addition to the existing species *A. areletta*, *A. areli*, and *A. areloides*, three new species are described from southwestern North America: *A. toddi* **sp. n.**, *A. geminocula* **sp. n.**, and *A. albifusa* **sp. n.**. A key to species, descriptions, illustrations of adults and genitalia, and distribution maps are included.

Keywords

Taxonomy, *Acontia areletta*, *Acontia areli*, *Acontia areloides*, *Acontia toddi*, *Acontia geminocula*, *Acontia albifusa*, Arizona, California, Colorado, Mexico, Nevada, New Mexico, Texas, USA, Utah, Wyoming

Introduction

The *Acontia areli* group consists of six species from southwestern North America and Mexico that are very similar in adult appearance, but differ in their genitalia. The basal

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half of the dorsal surface of the forewing is white or buff colored with scattered dark markings, the outer half is a maculate dark brown with a prominent white preapical costal spot. *Acontia areli* was described by F. H. H. Strecker in 1898, *A. areletta* by H. G. Dyar in 1907, and *Tarache* [= *Acontia*] *areloides* by W. Barnes and J. McDunnough in 1912. Subsequently, in the 1950's and 1960's, E. L. Todd identified three additional species and applied manuscript names to specimens in the collection of the National Museum of Natural History, Smithsonian Institution, Washington. Todd died before a manuscript was prepared. In the ensuing years, these names appeared on specimen labels in various collections, and in many cases misidentifications were made. For this reason, we decided not to perpetuate the Todd manuscript names and are providing new names to accompany the formal descriptions of the three new species.

Materials and methods

Repository abbreviations

Specimens were examined from the following collections:

CNC Canadian National Collection of Insects, Arachnids, and Nematodes, Ottawa, Ontario, Canada.
CDF Personal Collection of Clifford D. Ferris, Laramie, Wyoming, USA.
CUIC Cornell University Insect Collection, Ithaca, New York, USA.
FMNH The Field Museum, Chicago, Illinois, USA.
JBW Personal collection of J. Bruce Walsh, Tucson, Arizona, USA.
USNM National Museum of Natural History, Washington, District of Columbia, USA.

Dissecting methods and genital terminology. Dissection of genitalia and terms for genital structures and wing markings follow Lafontaine (2004).

Description abbreviations

DFW Dorsal forewing.
DHW Dorsal hindwing.
VFW Ventral forewing.
VHW Ventral hindwing.

Acontia areli group

Diagnosis. The *Acontia areli* group is superficially characterized by the division of the forewing into a dark brownish-gray outer half and a pale white or buff inner half; a prominent, single, subapical white patch on the costa; a large, rounded, partially blue-filled reniform spot, and an orbicular spot usually reduced to black upper and lower arcs.

Key to species of *Acontia areli* group

1 Forewing with dark shading on outer half of wing extending basally to cover all or part of orbicular spot; subapical white patch elongated, trapezoidal, about 2 × as long on costa as wide..... **2**

– Forewing with orbicular spot surrounded by pale shading on basal half of wing; subapical white spot triangular or square, about as long on costa as wide **3**

2 Hindwing white without fuscous band around margin; central Mexico ..... ***A. areletta* Dyar**

– Hindwing with fuscous band around margin; Arizona, New Mexico ..... ***A. areloides* (Barnes & McDunnough)**

3 Forewing with pale shading on basal half of wing diffusing into outer half of wing below reniform spot and usually partially surrounding it; Arizona ..... ***A. albifusa* Ferris & Lafontaine, sp. n.**

– Forewing with pale shading in basal half of wing and dark shading on outer half separated by sharp line basal to reniform spot (usually on outer edge of remnant of orbicular spot) **4**

4 Forewing with large mainly blue reniform spot with black patch on inner side of spot; a similar spot on medial line below reniform spot and resembling it, except black patch on outer edge of spot; Arizona, Mexico, Texas ..... ***A. geminocula* Ferris & Lafontaine, sp. n.**

– Forewing with dark shading in reniform spot forming central "pupil," or of scattered dark scales; medial line below reniform spot with irregular black area usually with some scattered blue scales; widely distributed in western North America... **5**

5 Forewing with pale basal area buff or yellowish white, contrasting with white subapical spot on costa; dark patch in lower part of medial line prominent and usually with many scattered blue scales; reniform spot with black central "pupil" ..... ***A. areli* Strecker**

– Forewing with pale basal area white, similar in color to subapical spot on costa; dark patch in lower part of medial line small, with few scattered blue scales; reniform spot filled with blue and gray scales..... ***A. toddi* Ferris & Lafontaine, sp. n.**

Descriptions

***Acontia areli* Strecker**
Figs. 1, 2-4, 17, 23, 28

Acontia areli Strecker, 1898: 11.

Type material. Lectotype ♂: New Mexico [FMNH, Chicago, USA]. Described from two males from New Mexico and one female from Arizona. A male labeled "*A. areli* ♂,

circular reniform with black pupil
irregular patch; inner margin with some bluish scales

DFW basal area buff

areli

large white trapezoidal spot
orbicular, reniform nearly obsolete
even vertical margin, sometimes obliterating orbicular

DFW basal area dark buff

areloides

reniform less prominent
area nearly uniformly brown with only a few scales of different color

DFW basal area nearly white

toddi

reniform inwardly produced with dark patch
second "reniform" spot with dark outer patch

DFW basal area nearly white, or very pale yellowish

geminocula

prominent dark patch distad of reniform
mottled, not unfrmly dark

DFW basal area creamy yellow

albifusa

Figure 1. Diagnostic characters for separating the five *Acontia areli* group species found in the United States. The Mexican *A. areletta* is similar to *A. areloides*, but with an all white hindwing.

Orig. Type. N.M. [red border]/ *Acontia Areli* Streck[er], 415. Arizona, Orig. types, H. K. M[orrison] [red border]/ *Acontia areli* Streck., Arizona, HKM, Orig. types, Strecker Colln 35726, Field Museum Nat. Hist./ Lepidoptera Type Photograph No. 339 Field Museum" is **hereby designated as Lectotype**. It is the widely distributed species generally known as *Acontia areli*, and is in good condition, except for a slightly frayed fringe at the apex of the left forewing.

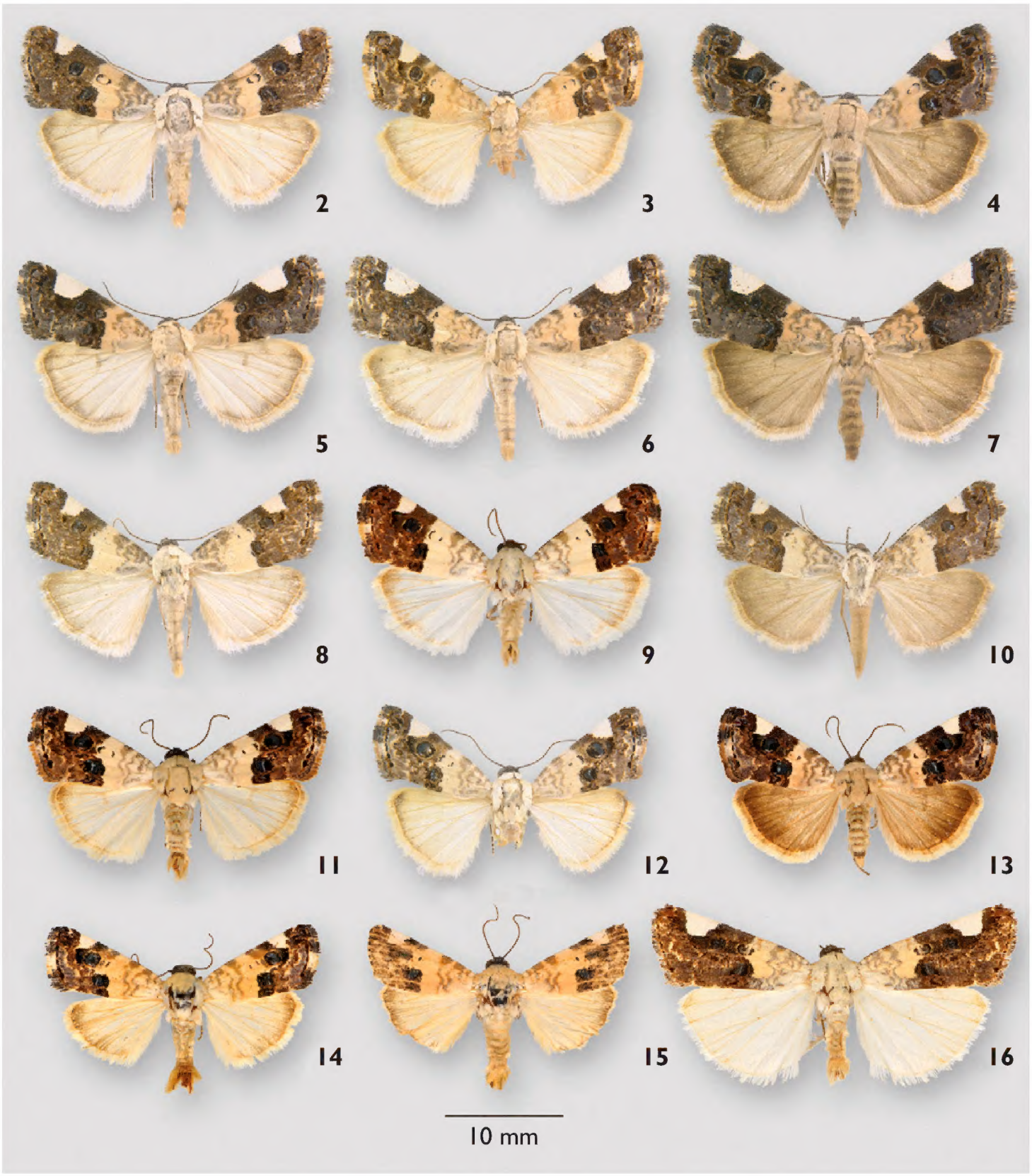
The remaining two syntypes have similar labels to the first three labels of the lectotype, but differ in the type numbers (Strecker Colln 35728 for the other male from New Mexico, and Strecker Colln 35727 for the female from Arizona). They are the species described below as *Acontia geminocula*.

Other material examined and distribution (Fig. 28). Approximately 1,200 specimens of both sexes were examined from western North America (17 dissections). **Arizona**: Apache, Cochise, Pima, Yavapai counties; canyons in Chiricahua and Huachuca Mts. **California:** Riverside, San Bernardino, San Diego counties. **Colorado:** Eagle, Garfield, La Plata, Mesa counties. **Nevada:** Elko, White Pine counties, Angel Lake, Humboldt Mts. **New Mexico:** Catron, Colfax, Grant, Hidalgo, McKinley, Otero, Rio Arriba, Sandoval, Socorro counties. **Texas:** Brewster, Culberson, Jeff Davis counties, Davis and Guadalupe Mts. **Utah:** Cache, Sanpete, Sevier, Juab, Utah counties. **British Columbia:** Kaslo. **Mexico:** Durango, 10 mi. (16 km) W of Durango. This species seems to have the widest geographic range of the six species in the group.

Diagnosis. *Acontia areli* is separated from its congeners by the DFW incompletely dark ringed pale orbicular spot, and from other species in the *A. areli* group by the black central pupil in reniform spot, irregular inner margin of brown area and associated irregular dark patch on the medial line with some bluish scales, and the buff color of the basal area of the forewing that contrasts with the white preapical spot.

Description. Adult male: Head – dark brown; antenna filiform; palpus porrect slightly longer than eye width, white basally, outer half brown with broad vertical white band in middle. **Thorax** – prothoracic collar, thorax, and abdomen creamy white, a few brown scales toward tip of tegula and on metathorax. *Foreleg*: coxa white with a few brown scales; femur and tibia outwardly brown, inwardly white, with white ring at middle and apex of tibia; tarsus brown with white rings at joints. *Middle leg*: femur white turning brown at femoral-tibial joint; tibia brown with white ring at base and near apex; tarsus brown with white rings at joints. *Hindleg*: femur and tibia white with light brown shading at tibial-tarsal joint; first tarsal joint white shading to brown at second segment joint; remaining tarsi brown, white-ringed at joints. *Wings*: male (forewing length (FWL): 10-12.5 mm). Dorsal forewing (DFW): ground color creamy-white over basal half with four irregular pale gray-brown vertical striations, remainder of wing brown with scattered paler areas producing a very sight mottled aspect; prominent white trapezoidal costal patch before apex; orbicular spot an incomplete narrow brown ring with creamy white center; reniform a circular dark ring with internal iridescent blue scales and black pupil; a brown irregular patch below reniform spot with some blue scales extending to inner margin of wing; terminal line and irregular series of dark dashes; fringe scales basally brown, paler at tips, with brown patch

below apex and at tornus. Dorsal hindwing (DHW): luminous white, nearly hyaline, with pale brown marginal band; fringe white. **Female** (FWL: 10-12 mm) – similar to male, but color generally darker, especially fringes, DHW light brown basally, shading to brown on outer margin. **Male genitalia** (Fig. 17) – *uncus*: decurved, slender, tapering to a pointed tip. *Valves*: asymmetrical; right valve broad, approximately rectangular,



Figures 2-16. *Acontia areli* group adults. **2-4**. *A. areli*, **2** ♂, Catron Co., NM; **3** ♂, Grant Co., NM; **4** ♀, Grant Co., NM; **5-7**. *A. areloides*, **5** ♂, Grant Co., NM; **6** ♂, Catron Co., NM; **7** ♀, Catron Co., NM. **8-10**. *A. toddi*, **8** ♂, holotype, Emery Co., UT, **9** ♂, Yavapai Co., AZ, **10** ♀, Emery Co., UT. **11-13**. *A. geminocula*, **11** ♂, holotype, Yavapai Co., AZ; **12** ♂, Cochise Co., AZ; **13** ♀, Pima Co., AZ. **14-15**. *A. albifusa*, **14** ♂, holotype, Pima Co., AZ, **15** ♀, Pima Co., AZ. **16.** *A. areletta* ♂, San Jacinto, Mexico.

apex pointed dorsally, without apical corona; clasper on ventral margin wraps around valve end; right valve with smooth saccular extension tapering evenly to apex; left valve without saccular extension. *Aedeagus*: smoothly sclerotized except for a narrow finely spiculate posterior band that extends on to base of vesica; everted vesica with three diverticula, an unequally bilobed, unarmed, subbasal diverticulum, a shorter, rounded diverticulum on left with a large, tapered, curved, heavily sclerotized cornutus at apex, and a very small ventral diverticulum with a similar cornutus; apical part of vesica with two large swollen lobes, both densely covered with field of short, stout spines forming rasp-like patches; lower (right) lobe with central keel of larger spines. **Female genitalia** (Fig. 23) – ostium bursae broad, funnel like; ductus bursae broad, expanding toward junction with corpus bursae, length ca. 0.7 × length of corpus bursae; corpus bursae ovoid with spine-filled pouch posteriorly on left.

Biology. Unknown. Habitats are open pinyon-juniper-oak areas and open ponderosa pine forest. Adults during July and August in canyons and forested plateaus from 4800-7500' (1460-2285 m).

Acontia areloides (Barnes & McDunnough)

Figs. 1, 5-7, 18, 24, 29

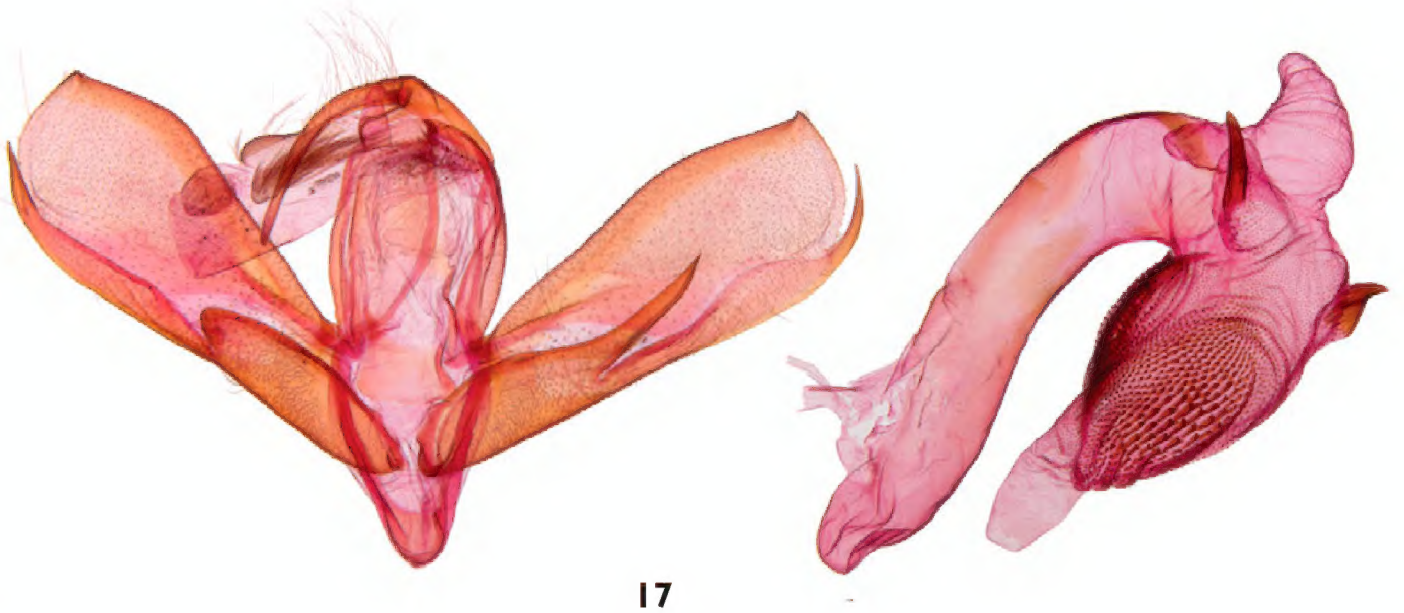
Tarache areloides Barnes and McDunnough, 1912: 92.

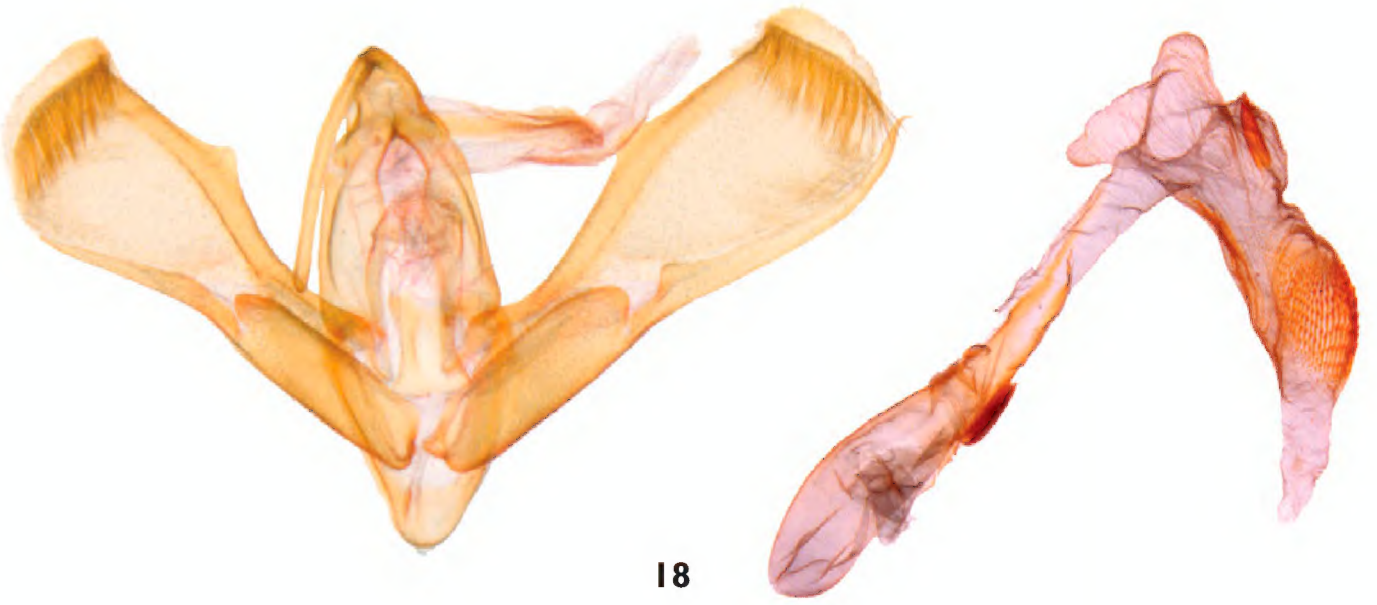
Type material. Syntypes 3 ♂, 5 ♀: Arizona, White Mts. [USNM, Washington, DC].

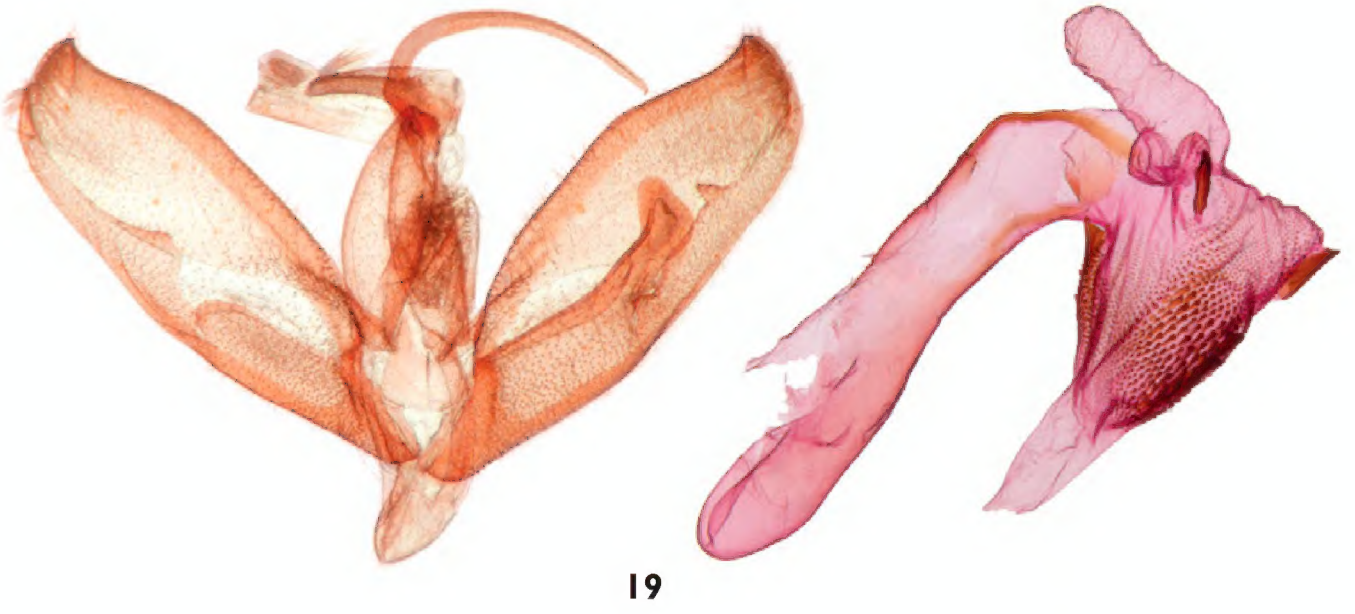
Other material examined and distribution (Fig. 29). Ninety-five specimens were examined (7 dissections). **Arizona**: Apache and Coconino cos.; White Mts. **New Mexico**: Bernalillo, Catron, Grant, Lincoln, McKinley, Rio Arriba, Sandoval, and Socorro cos.; Magdalena, Pinos Altos, Sandia, and San Francisco Mts.

Diagnosis. *Acontia areloides* is separated from its congeners by its larger size, even vertical margin between the buff basal half of the forewing and the brown outer half, the latter obscuring the orbicular and reniform spots, and large white trapezoidal preapical costal spot, and the fuscous infusion on the hindwing.

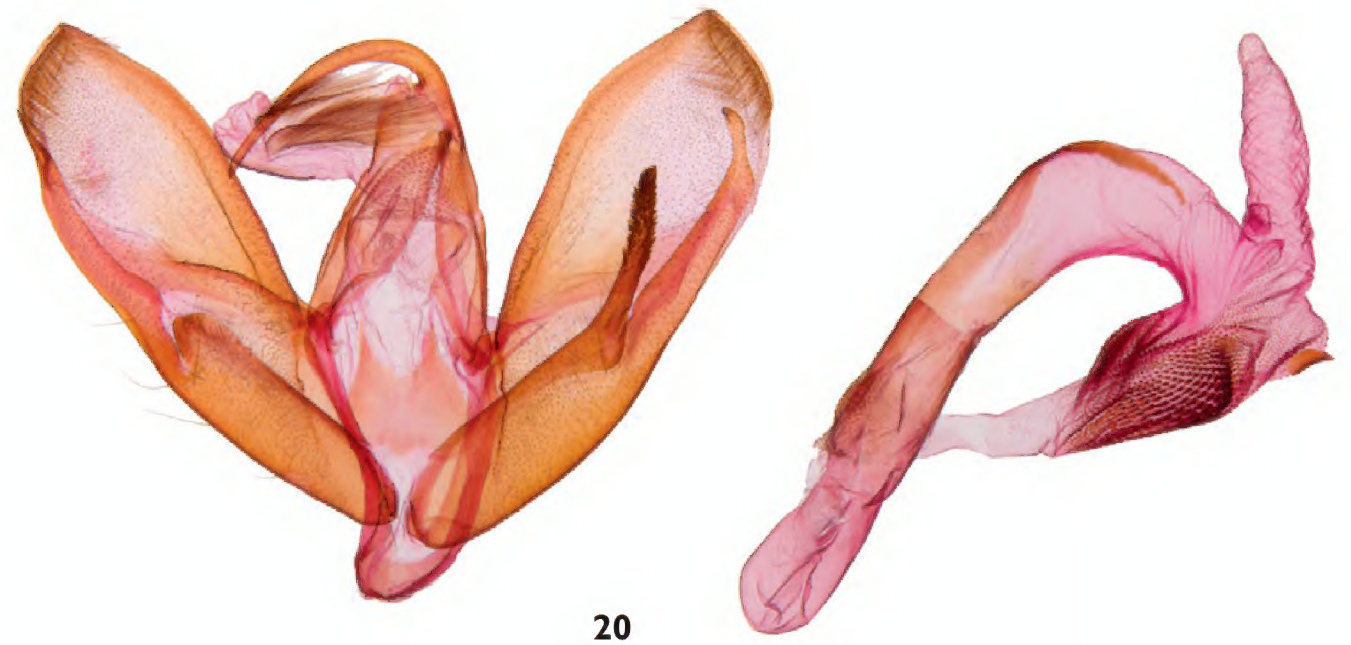
Description. Adult male: Head – dark brown; antenna filiform; palpus porrect, slightly longer than eye width, white basally, outer half brown with vertical paler band in middle. **Thorax** – prothoracic collar and thorax creamy white with a few widely scattered brown scales. *Foreleg*: coxa white with a brown patch; femur and tibia outwardly brown, inwardly white, tan brush at tibial-tarsal joint; tarsi brown with white rings at joints. *Middle leg*: femur white, turning brown at femoral-tibial joint; tibia brown, white ringed at tibial-tarsal joint; tarsi brown with white rings at joints. *Hindleg*: femur, tibia white with brown "knee" at femoral-tibial joint and light brown shading at tibial-tarsal joint; first tarsal joint white shading to brown at second segment joint; remaining tarsi brown, white-ringed at joints. *Wings*: male (FWL 12-14 mm). DFW: ground color dark creamy-white over basal half with several irregular light brown vertical striations, then sharp nearly straight vertical transition to brown for remainder of wing, with some



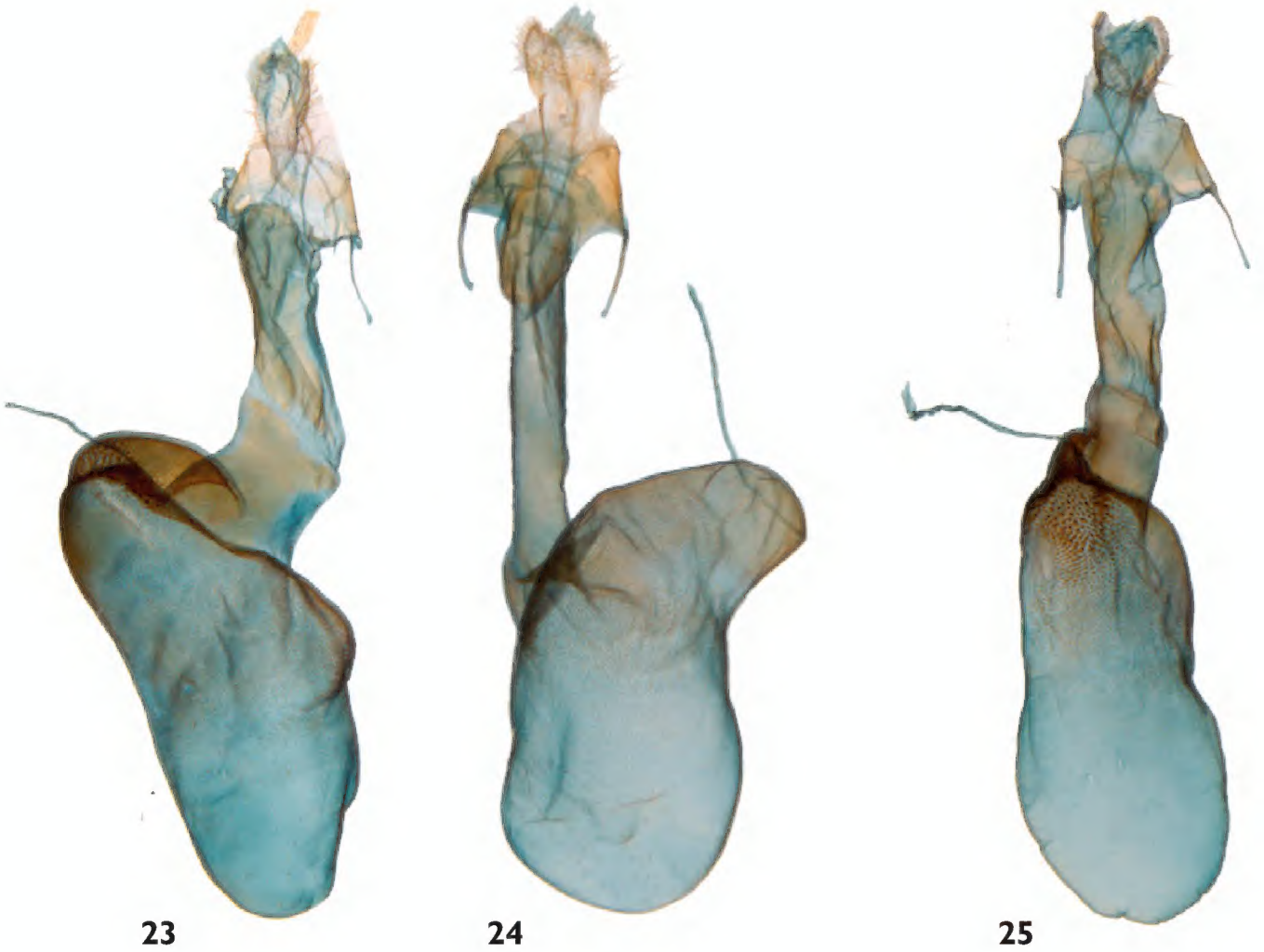




Figures 17-19. *Acontia areli* group male genitalia (left – ventral; right – lateral). **17** *A. areli*, **18** *A. areloides*, **19** *A. toddi*.



Figures 20-22. *Acontia areli* group male genitalia (left – ventral; right – lateral). **20** *A. geminocula*, **21** *A. albifusa*, **22** *A. areletta*.



Figures 23-27. *Acontia areli* group female genitalia. **23** *A. areli*, **24** *A. areloides*, **25** *A. toddi*, **26** *A. geminocula*, (26a ventral; 26b lateral), **27** *A. albifusa*.

scattered paler areas producing only a very slightly mottled aspect; prominent large white trapezoidal costal patch basad of apex; orbicular spot straddles pale-to-brown boundary, a brown ring with blue interior and brown pupil; reniform spot a circular dark ring with internal iridescent blue scales and black pupil; below orbicular spot a dark brown crescent and distally smeared patch with some bluish scales; terminal line a series of dark dashes; fringe brown interrupted by small white patch below apex and another at middle of outer margin of wing. DHW: luminous white, nearly hyaline, with pale brown marginal band; fringes white. **Female** (FWL 12-14 mm) – similar to male, but color generally darker, especially fringes, DHW light brown basally shading to brown on outer margin. **Male genitalia** (Fig. 18) – *uncus*: decurved, very long and narrow with slightly expanded rounded apex. *Valves*: asymmetrical; right valve narrower at base than apex with triangular process on dorsal margin beyond middle, apex rounded, with corona; clasper on lower margin of valve with triangular dorsal process near base, apex spine-like, curving around lower end of valve; sacculus broad with apex rounded, without saccular extension; left valve similar to right valve except sacculus smaller and clasper shorter with with less prominent dorsal bulge. *Aedeagus*: similar to that of *A. areli*, but more slender and spiculate band at apex ending well before base of vesica; everted vesica with trilobed subbasal diverticulum, a medial, rounded diverticulum with a heavily sclerotized, fin-like cornutus dorsally, and a distal lobe covered with rasp-like oval patch of small heavily chitinized projections. **Female genitalia** (Fig. 24) – ostium bursae funnel-like; ductus bursae a long unsclerotized tube joining kidney-shaped corpus bursae at midpoint; corpus bursae mostly membrane, lightly sclerotized posteriorly.

Biology. Unknown. Adults in late July–September in forested mountain canyons from 5600-8300' (1710-2530 m).

Note. A single male specimen was examined from San Juan del Rio, Queretaro, south-central Mexico that is nearly identical to *A. areloides*, but differs in some aspects of the male genitalia. We do not feel it appropriate to describe a new species based upon a single specimen.

Acontia areletta Dyar

Figs. 16, 22

Acontia areletta Dyar, 1907: 229.

Type material. Holotype ♂: Mexico, Mexico City [USNM, Washington, DC].

Other material examined. 1 ♂, Mexico, Federal District, San Jacinto.

Diagnosis. *Acontia areletta* resembles *A. areloides*, from which it can be separated by its white hindwing, lacking the fuscous band around the margin as found in *A. areloides*.

Description. As for male of *A. areloides* excepting the dorsal hindwing, which in *A. areletta* is pure white, without a fuscous marginal band. The female is unknown. **Male genitalia** (Fig. 22; 2 dissections) – *uncus*: decurved, very long and narrow with very slightly expanded rounded apex. *Manica* (memranous tube posterior to juxta) with

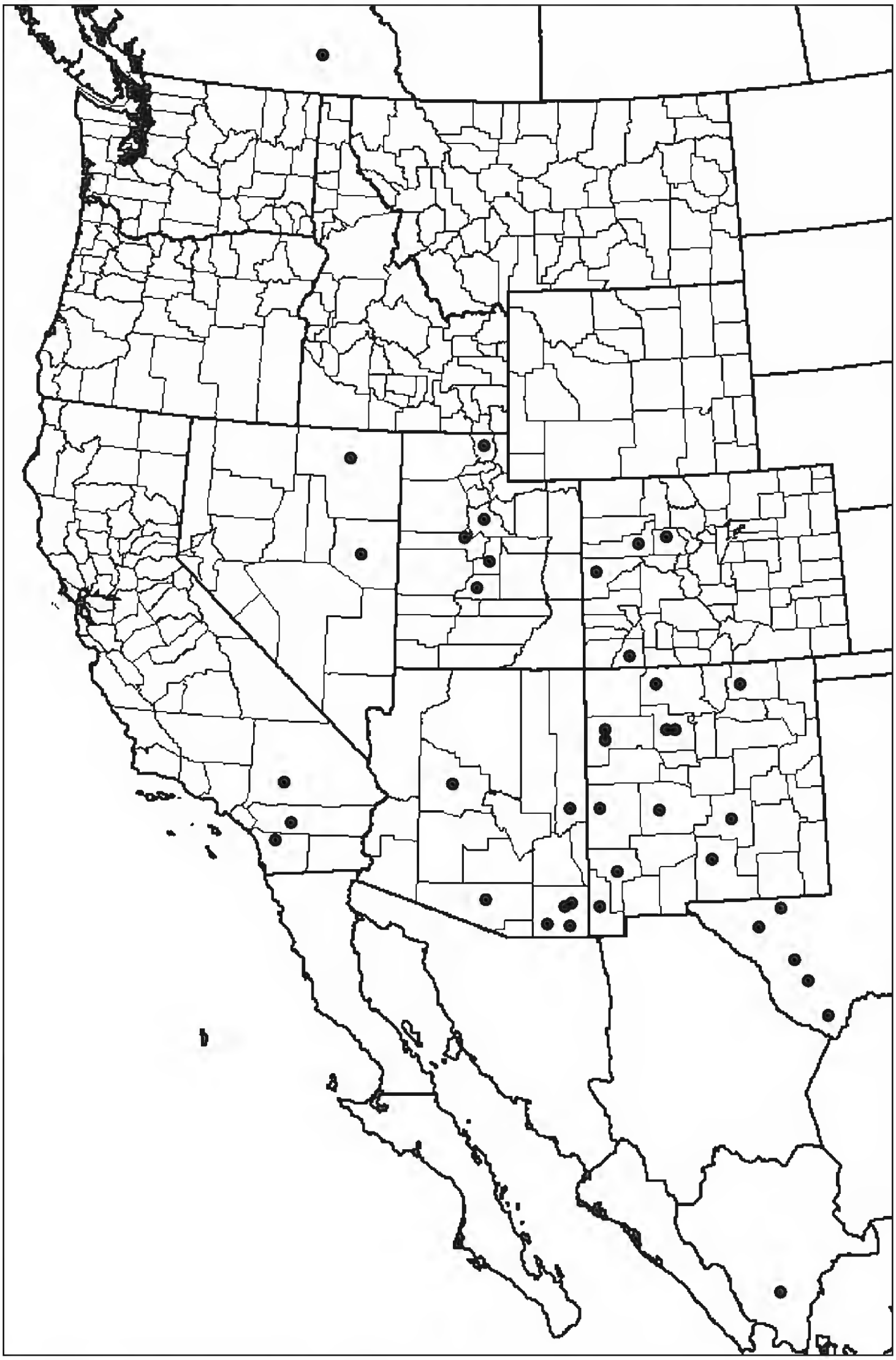
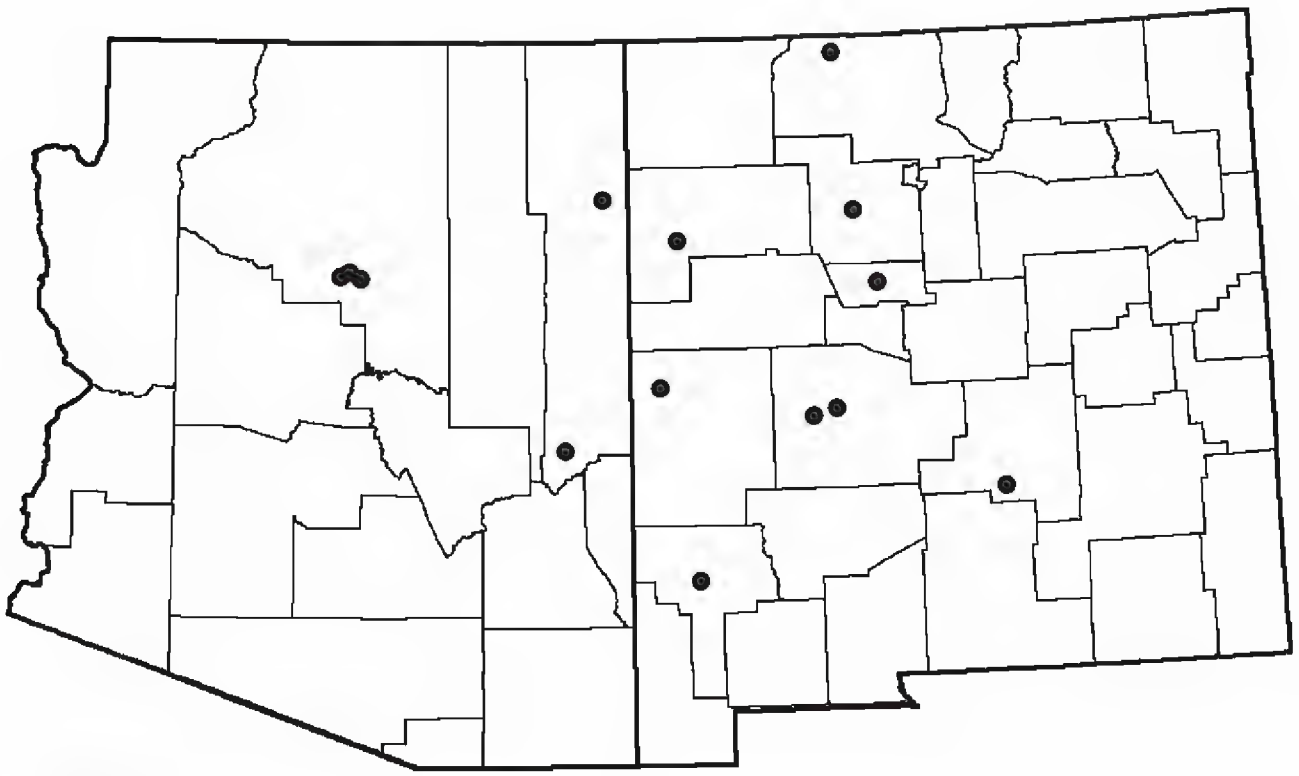


Figure 28. *Acontia areli* distribution map.



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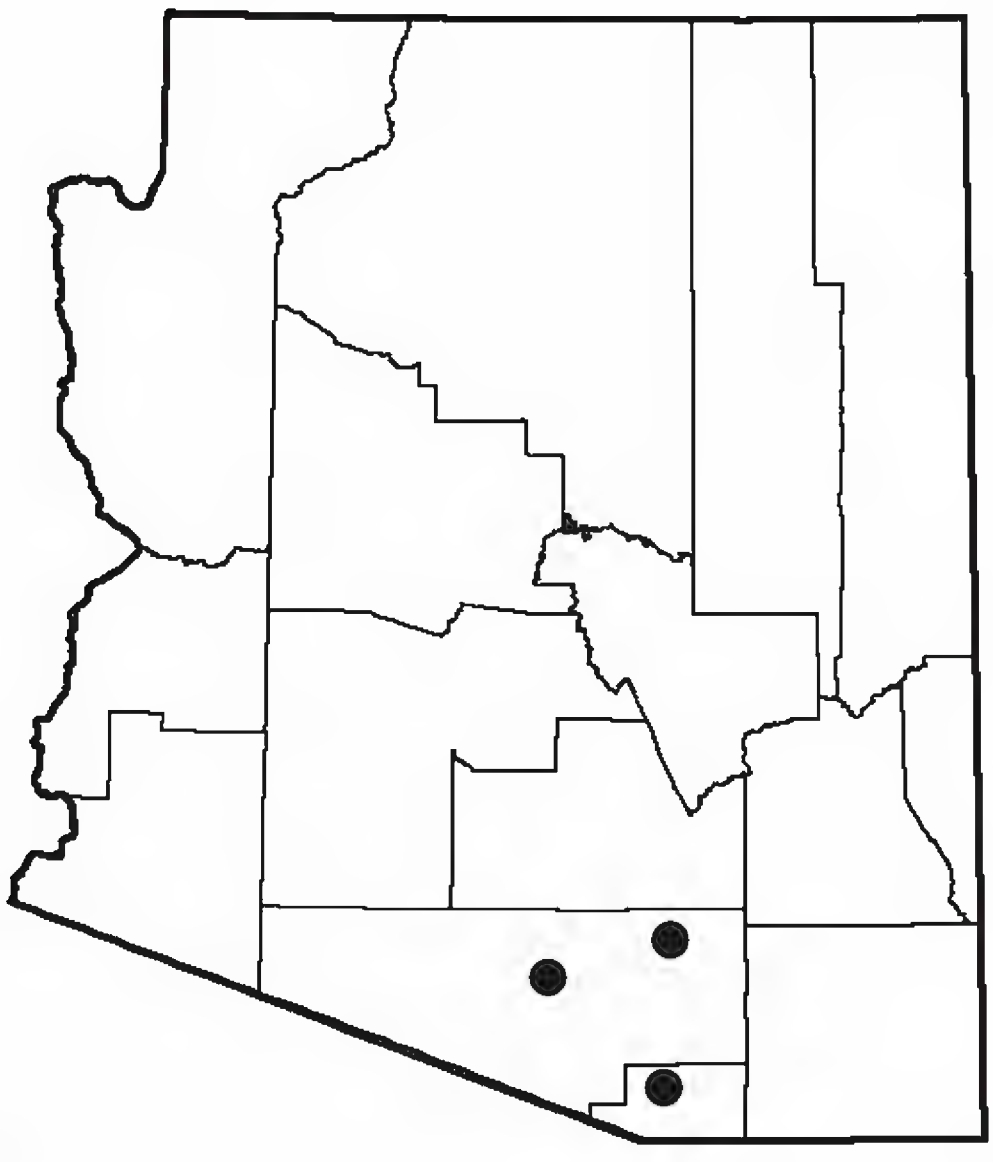

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Figures 29-30. *Acontia* distribution maps. **29** *A. areloides*. **30** *A. albifusa*.

stout spine-like field of sclerites (attached to outer edge of aedeagus in Fig. 22). *Valves*: asymmetrical; right valve broad, approximately rectangular, with blunt process near middle of dorsal margin, apex pointed dorsally, without apical corona; sacculus without posterior extension; clasper swollen basally on dorsal margin, then tapering evenly to spine-like apex extending slightly beyond ventral margin of valve; left valve similar to right, but sacculus smaller and clasper much shorter. *Aedeagus*: similar to that of *A. areloides*; everted vesica similar to that of *A. areloides*, but with two small additional subbasal diverticula. **Female genitalia** – unknown.

Biology. Unknown. Adults from late October to November.

***Acontia toddi* Ferris & Lafontaine, sp. n.**
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Figs. 1, 8-10, 19, 25, 31

Type material. Holotype ♂: Utah, Emery Co., San Rafael Reef area, 38° 39.2' N, 110° 43.1' W, 5500' (1675 m), 18-19 May, 1999, C. D. Ferris [CNC, Ottawa, Canada]. **Paratypes:** 10 ♂, 13 ♀. UTAH: Beaver Co., Beaver, 6 mi E, 6300', D. F. Hardwick (2 ♀); Emery Co., San Rafael Reef area, 5300', 22 May, 2003 (1 ♂, 2 ♀), 15 May, 2007 (4 ♂, 4 ♀); Garfield Co., Star Springs, 36 mi S Hanksville, 6300', 27 Aug. 1971, D. F. Hardwick (2 ♀); Juab Co., Callao, 29 July 1941, G. F. Knowlton & F. C. Harmston (1 ♂); Juab Co., Eureka, 16 July–21 Aug. 1911, Tom Spalding (4 ♂, 3 ♀). Paratypes deposited in CNC, USNM, and the personal collection of C. D. Ferris.

Other material examined and distribution (Fig. 31). 184 specimens not included in type series were examined (28 dissections). **Arizona.** Apache, Cochise, Coconino, Mohave, Pima, Pinal, and Yavapai cos.; Chiricahua, Huachuca, Hualupai, Santa Catalina, and White Mts. **California.** San Bernardino and Riverside cos.; Ivapah Mts. **Montana.** Sweet Grass Co. **Nevada.** Clark, Esmeralda, Lincoln, Lyon, and Nye cos. **New Mexico.** Chaves, Grant, Hidalgo, Luna, and Otero cos. **Oregon.** Baker Co. Texas: Culberson, Jeff Davis cos., Davis Mts. **Wyoming.** Weston Co.; Black Hills. **Mexico.** Baja California Norte 29° 46' N 114° 46' W. April–August in dry forest clearings, desert canyons, riparian and reef areas from 2900–7600' (885-2320 m). Apparently two generations in some areas (e.g., Grant Co., New Mexico).

Note. Material of this species was distributed by E. L. Todd under the unpublished manuscript name "*Acontia deserticola*."

Etymology. We take pleasure in naming this species in honor of the late E. L. Todd.

Diagnosis. DFW basal area nearly white in both sexes; dark brown distal area nearly uniformly brown with only a few scales of different color; orbicular spot nearly obsolete; reniform spot less prominent than in *A. areli* and *A. geminocula*, and without dark "pupil."

Description. Adult male: Head – dark brown with a few whitish scales at antennal base; antenna filiform; palpus porrect, slightly longer than eye width, white basally, brown at tip. **Thorax** – prothoracic collar and thorax. *Foreleg*: brown, white-ringed in middle of tibia and at joints. *Middle leg*: femur and tibia white with brown rings

at joints; tarsi brown, white ringed at joints. *Hindleg*: femur white; tibia white with light brown shading at tibial-tarsal joint; first tarsal segment white shading to brown at joint with second segment; remaining tarsi brown, white-ringed at joints. *Wings*: male (FWL 10-13 mm). DFW: ground color white over basal half with two small very pale brown patches on costa and a few scattered pale brownish scales basad; outer half of wing brown with a few scattered small white and dark scale patches; prominent, ap-

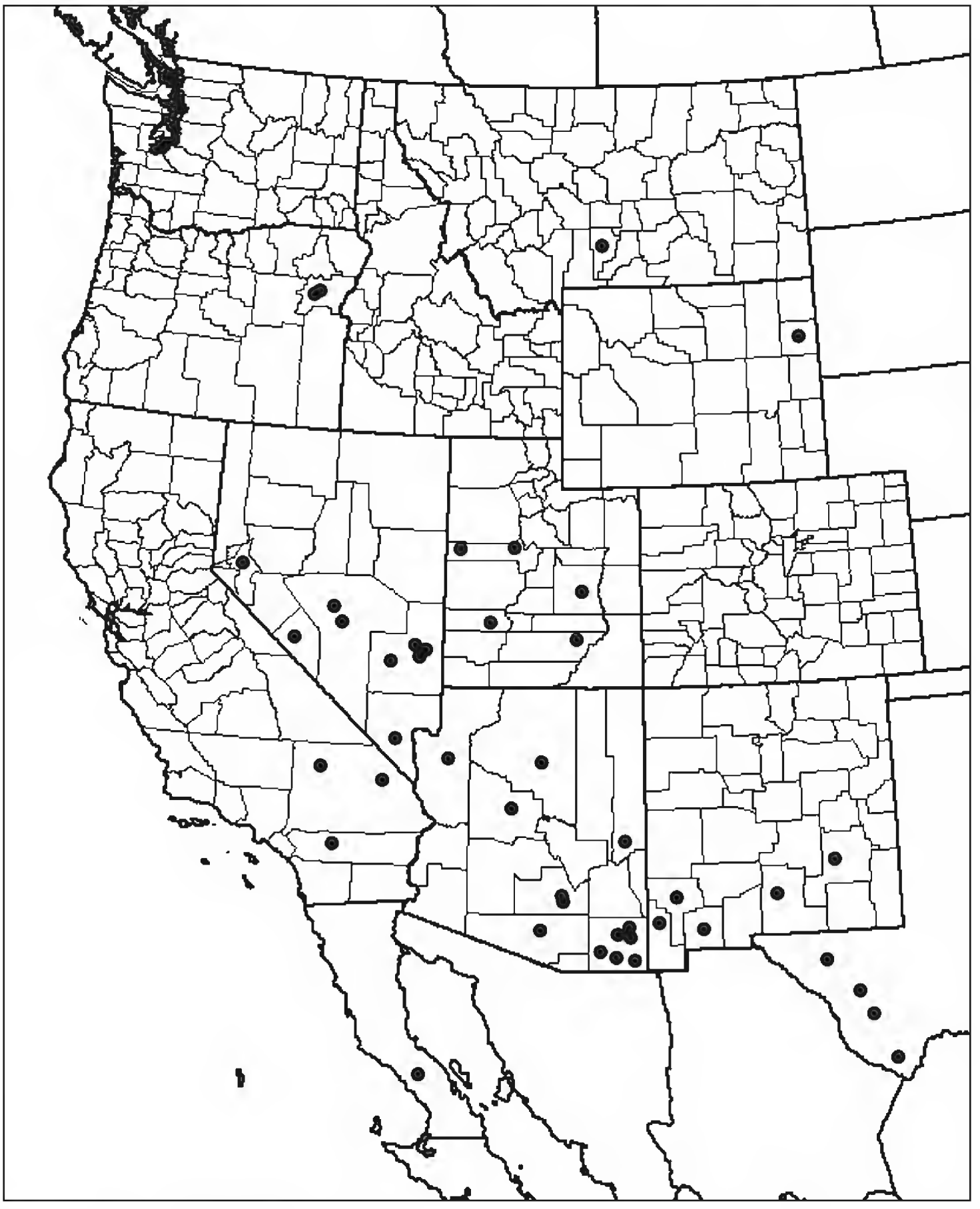

Figure 31. *Acontia toddi* distribution map.

proximately square, white preapical patch on costa; orbicular spot virtually obsolete, defined only by a few dark scales; reniform spot circular, filled with darker scales than background; terminal line a series of dark dashes; fringe basally brown, white at tips. DHW: luminous white, nearly hyaline, with pale brown marginal band; fringe white. **Female** (FWL 10-12 mm) – similar to male but DFW basal area with increased darker overscaling; DHW pale tan with pale brown marginal band. **Male genitalia** (Fig. 19) – *uncus*: long, slender, slightly swollen at mid-length, tapers to pointed tip. *Valves*: asymmetrical; right valve broad, tapering slightly toward apex with slight preapical concavity on dorsal margin; apex rounded with slight dorsal point; corona present but with fewer setae than in other species; clasper on ventral margin with triangular process near middle of dorsal margin, apex spine-like, extending around posteroventral angle of valve; right sacculus with apically spatulate extension; left valve similar but sacculus smaller and without posteror extension; clasper with broad, triangular, dorsal process near base. *Aedeagus*: similar to that of *A. areli*; everted vesica membrane plum-shaped with large unarmed thumb-like dorsal diverticulum subbasally; two large, heavily sclerotized horn-like cornuti, one at base of diverticulum and one near middle of outer margin of vesica; apical part of vesica with two large fields of chitinized projections forming rasp-like patches with band of stouter spines along middle of each patch. **Female genitalia** (Fig. 25) – ostium bursae funnel-like, tapering only slightly to junction with ductus bursae; ductus bursae tubular, lightly sclerotized, length about 0.6 × length of ovoid corpus bursae; spine-filled posterior pouch of corpus bursae to left of ductus.

Biology. Unknown. Adults April–August in dry forest clearings, desert canyons, riparian and reef areas from 2900-7600' (885-2320 m). Apparently two generations in some areas (e.g., Grant Co., New Mexico).

***Acontia geminocula* Ferris & Lafontaine, sp. n.**
urn:lsid:zoobank.org:act:CCB85133-9645-4C5E-B32D-2A66F0EA66AE
Figs. 1, 11-13, 20, 26, 32

Type material. Holotype ♂. Arizona, Yavapai Co., Granite Dells, 4 mi N Prescott, 2 Sept., 1970, L. M. Martin. [CNC, Ottawa, Canada]. **Paratypes** 110 ♂, 133 ♀ (13 dissections): **Arizona.** Same locality and collector as for holotype, 9 Aug.–23 Sept. 1970 (3 ♂); Cochise Co., Chiricahua Mts., Cave Creek Canyon, 5400', 1 July–4 Sept. 1966, J. G. Franclemont (12 ♂, 7 ♀); Cochise Co., Chiricahua Mts., Cave Creek Canyon, 4880', 7 July–25 Aug. 1967, J. G. Franclemont (7 ♂, 11 ♀); Cochise Co., Garden Canyon, 4 Aug. 1966, R. F. Sternitsky (1 ♀); Cochise Co., Huachuca Mts., Miller Canyon, 5000', 29 June–17 Aug., 1974, J.G. Franclemont (20 ♂, 32 ♀); Cochise Co., Huachuca Mts., Ramsey Canyon, 23 Sept. & 4 Oct., 1967, R. F. Sternitsky (4 ♀); Cochise Co., Paradise, Barnes Coll. (6 ♂, 1 ♀); Cochise Co., Portal, 5 mi SW, 5400', 2 Oct., 1969, D. F. Hardwick (1 ♂); Cochise Co., Sierra Vista, 12 Sept. 1967, R. F. Sternitsky (2 ♀); Cochise Co., Huachuca Mts., Ash Canyon, 5170' (1575 m), 3 July, 2005, C. D. Ferris (1 ♂, 1 ♀). Pima Co., Baboquivari Mts., 5000', 1-7 July

1923 & 5700', 15-30 July 1923 & 1-15 Sept. 1923, O. C. Poling (2 ♂, 2 ♀); Pima Co., Baboquivari Mts., Brown Canyon, 4100', 20 Aug. 2006, T. Mustelin & 20 Aug. 2008, C. Schmidt & L. Crabo (1 ♂, 1 ♀); Santa Cruz Co., Canelo, 20 Aug. 1966, R. F. Sternitsky (1 ♀); Santa Cruz Co., Sycamore Canyon, 4400' (1340 m), 9 Aug., 1990, C. D. Ferris (1 ♂); Santa Cruz Co., Huachuca Mts., Copper Canyon, 6050', 9 July 2004, J. B. Walsh (2 ♂); Santa Cruz Co., Patagonia Mts., Harshaw, 4900', 27 June 2006, J. B. Walsh (1 ♂); Santa Cruz Co., Peña Blanca, 3950', 11,18,23 Aug., 1960, J. G. Franclemont (6 ♂, 1 ♀); Santa Cruz Co., Santa Rita Mts., Madera Canyon, 4880', 4 July–6 Sept.,1959 & 23 July–28 Aug., 1960, J.G. Franclemont (43 ♂, 67 ♀) & Madera Canyon, 5100', 10-26 July 1964, D. R. Davis (2 ♂); Santa Cruz Co., T20S, R14E. Sec. 2, Madera Canyon, Santa Rita Lodge, 4840', 5 July 1987, E. H. Metzler (1 ♂, 1 ♀). Yavapai Co., Prescott, 2, 4 Sept., 1907, R. C. Kunze (2 ♂). **Texas**: Brewster Co., 6.5 mi south of Alpine, 30°17.4'N 103°35.6'W 9 Aug. 1991, Eric H. Metzler (1 ♂, 1♀). Paratypes deposited in CNC, CUIC, USNM, and the personal collections of C. D. Ferris, E. H. Metzler, and J. B. Walsh.

Other material examined and distribution (Fig. 32). Mexico. Chihuahua, Mesa del Huracá n (1 ♂).

Note. Material of this species was distributed by E. L. Todd under the unpublished manuscript name "*Acontia vasticola*."

Etymology. The name of this species refers to the pair of eye-like spots on each forewing.

Diagnosis. DFW basal area nearly white in male (like *A. toddi*), pale buff in female (like *A. areli*); distal area brown mottled with paler areas; reniform spot inwardly produced with dark distal patch. Differs from other four similar species in having a second reniform-like spot with dark outer patch below reniform.

Description. Adult male: Head – dark brown; antenna filiform; palpus porrect slightly longer than eye width, white basally, outer half brown with vertical white band in middle. **Thorax** – prothoracic collar, thorax and abdomen white. *Foreleg*: coxa white with brown patch near middle; femur, tibia, and tarsus brown, white-ringed in middle of tibia and at joints. *Middle leg*: femur and tibia white with brown rings at femoral-tibia joint and near apex of tibia; tarsus brown, white-ringed at joints. *Hindleg*: femur and tibia white with light brown shading at tibial-tarsal joint; first tarsal segment white shading to brown at joint with second segment; remaining tarsi brown, white-ringed at joints. *Wings*: male (FWL 10-11 mm). DFW: ground color creamy-white over basal half with pale brown patchy maculation, brown on remainder of wing with scattered paler areas producing a mottled aspect; prominent white skewed, trapezoidal preapical patch on costa; orbicular spot virtually obsolete, defined only by a few dark scales; reniform spot circular with iridescent blue scales filling distal half, below which a second reniform-like patch with brown and blue scales; a brown bar along inner margin below reniform spot; terminal line a series of dark dashes; fringe brown basally, white at tips, with brown patch below apex. DHW: luminous white, nearly hyaline with pale brown marginal band; fringe white. **Female** (FWL 10-12 mm) – similar to male, but DFW basal area buff; DHW pale tan, shading to pale brown on marginal band. **Male genitalia**

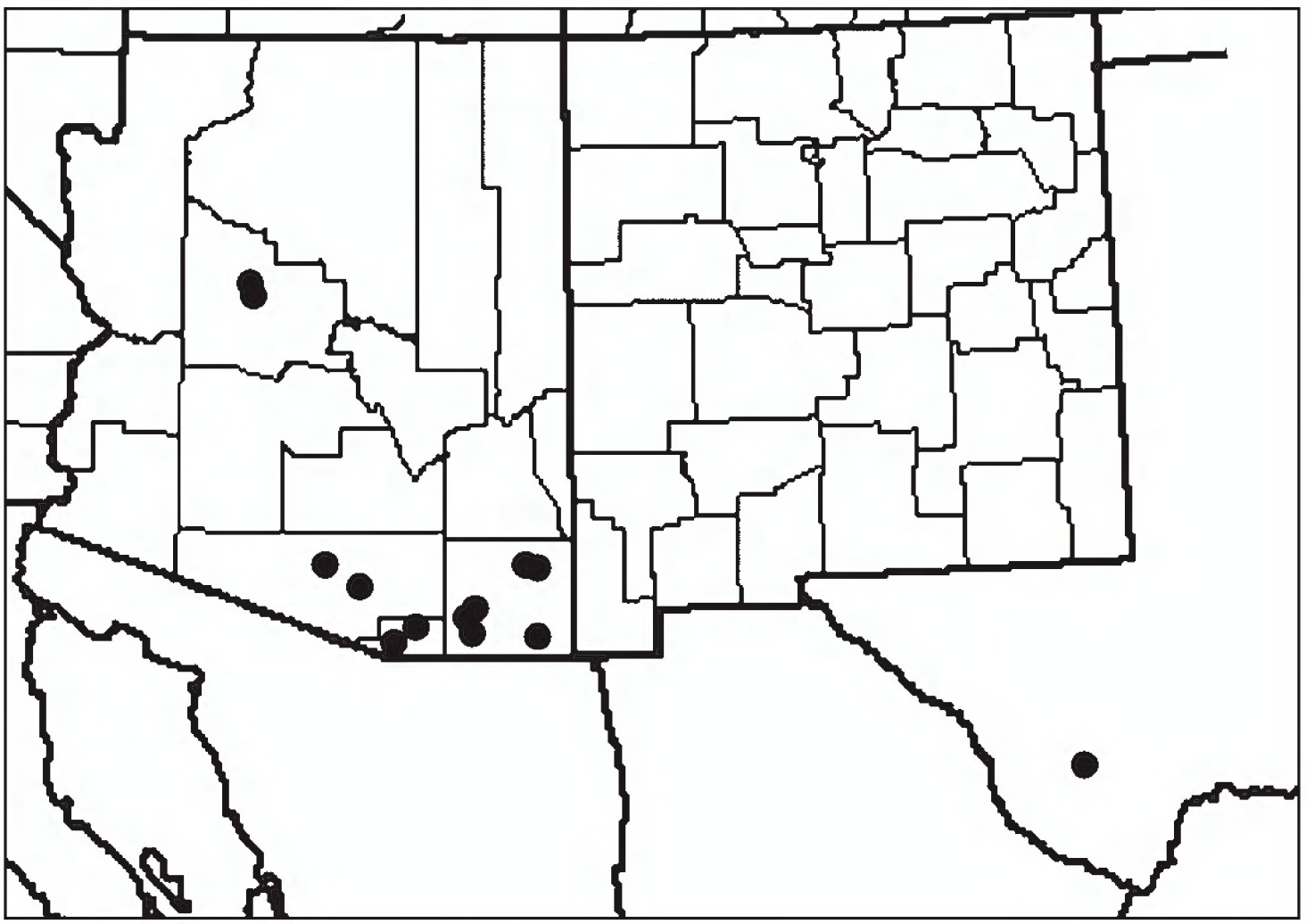

Figure 32. *Acontia geminocula* distribution map.

(Fig. 20) – *uncus*: decurved, long, narrow, tapering to pointed tip. *Valve*: asymmetrical; right valve broad mesially, tapered toward apex, weakly pointed apically; corona present but weak; right valve with clasper on ventral margin; clasper only slightly tapered until 1/5 from apex, then abruptly tapered to finger-like process with rounded apex that bends dorsally toward middle of cucullus; saccular extension elongate, apical 2/3 densely spiny, like a mace; left valve similar to right valve, but sacculus and valve narrower and clasper more evenly tapered to apex; apex sharply pointed. *Aedeagus*: very similar to that of *A. toddi* except two rasp-like spine patches in everted vesica with more evenly sized sclerites and subbasal diverticulum without cornutus near base. **Female genitalia** (Fig. 26) – most similar to those of *A. toddi*, but ostium bursae much wider and spine-filled pouch at end of corpus bursae to right of ductus bursae in *A. geminocula*.

Biology. Unknown. Adults July–September in riparian canyons from 4100-7400' (1250-2250 m).

Acontia albifusa Ferris & Lafontaine, sp. n.

urn:lsid:zoobank.org:act:0454EE2E-1B4D-4C51-9A87-CD5CE24B84CA
Figs. 1, 14-15, 21, 27, 30

Type material. Holotype ♂: Arizona. Pima Co., Mt Lemmon Hwy., mi 2.2, 3500', saguaro forest habitat, 13 Aug. 2004, J. B. Walsh. [CNC, Ottawa, Canada]. **Paratypes**

8 ♂, 1 ♀ (6 dissections): **Arizona**: Pima Co., Mt Lemmon Hwy., mi 5.7, 4400', oak riparian habitat, 18 June & 14 Sept. 2004, J. B. Walsh (2 ♂); Pima Co., Baboquivari Mts., 15-30 Aug., 1924, O. C. Poling (1 ♂); Pima Co., Baboquivari Mts., Brown Canyon, 3880' (1183 m), 19 Aug., 2006, C. D. Ferris (1 ♂); "Arizona" (2 ♂); Santa Cruz Co., Santa Rita Mts., Madera Canyon, 4800', 30 June & 2 July 1959, 1 July 1960, J. G. Franclemont (2 ♂, 1 ♀). Paratypes deposited in CNC, CUIC, USNM, and the personal collections of C. D. Ferris and J. B. Walsh.

Distribution (Fig. 30).

Note. Material of this species was distributed by E. L. Todd under the unpublished manuscript name "*Acontia agricola*."

Etymology. The name of this species refers to the pale basal coloring that diffuses into the dark outer shading.

Diagnosis. DFW basal area creamy yellow in both sexes; brown area mottled, not uniformly dark; prominent dark patch distal to reniform spot.

Description. Adult male: Head – dark brown with circular pale patch on frons; antenna filiform; palpi porrect slightly longer than eye width, white basally, shading to brown distally head dark brown. **Thorax** – prothoracic collar and thorax white. *Foreleg*: coxa white with middle brown spot; femur, tibia and tarsus brown with white-ring in middle of tibia and at joints. *Middle leg*: femur and tibia white with brown rings at femoral-tibia joint and near apex of tibia; tarsus brown, white-ringed at joints. *Hindleg*: femur and tibia white; first tarsal segment white shading to brown at joint with second segment; remaining tarsi brown, white-ringed at joints. *Wings*: male (FWL 9.5-11 mm). DFW: ground color dark creamy-white over basal half of wing with pale brown transverse lines; splotchy brown and pale on remainder of wing producing a very mottled aspect; prominent white preapical patch on costa; orbicular spot virtually obsolete, defined only by a few dark scales; reniform spot circular, outlined in back and filled mainly with iridescent blue scales; a prominent dark bar distal to reniform spot; a second reniform-like spot below and proximal to reniform spot irregularly outlined in black and with some blue scales in middle; a brown bar below this spot on inner margin; terminal line an irregular series of dark dashes; fringe a mixture of white, gray, and pale brown scales with pale-colored scales concentrated to form a patch near middle of wing and a smaller patch distal to reniform spot. DHW: luminous white, nearly hyaline, with pale brown marginal band; fringe white. **Female** (FWL 10.5 mm, 1 specimen) – similar to male. **Male genitalia** (Fig. 21) – *uncus*: decurved, long, narrow, tapering to pointed tip. *Valve*: asymmetrical; right valve roughly rectangular, pointed at apex of dorsal margin; corona well-developed; clasper on ventral margin of right valve, narrower near base than at ventral apex of cucullus where clasper abruptly tapers into a long, curved spine follows outer margin of cucullus almost to apex; dorsal margin of clasper with elongated, triangular process on dorsal margin near base; saccular process smooth, broad, somewhat spatulate apically, lying along dorsal margin of clasper; left valve similar to right valve but saccular extension absent and apical part of clasper with spine-like apical part reduced to short inward hook at ventral apex of valve. *Aedeagus*: very similar to that of *A. toddi* except cornutus at base of subbasal diverticulum larger

than in *A. toddi*. **Female genitalia** (Fig. 27) – ostium bursae funnel-like, tapering only slightly to junction with ductus bursae; lower portion of tubular ductus bursae moderately sclerotized, in length about 0.45 × length of ovoid corpus bursae; spinose pouch of corpus bursae to left of ductus.

Biology. Unknown. Adults June–September in oak habitat riparian canyons and saguaro cactus forest, 3500-4800' (1065-1465 m).

Acknowledgments

We thank Michael Pogue (Systematic Entomology Laboratory, National Museum of Natural History, Washington, DC), Martin Honey (Natural History Museum, London, UK), Bruce Walsh (Tucson, Arizona), Richard Hoebeke and James Liebherr (Cornell University, Ithaca, New York), and Eric Metzler (Alamogordo, New Mexico) for the loan of specimens. We thank John Rawlins (Carnegie Museum of Natural History, Pittsburgh, Pennsylvania) for providing us with a photograph of a type specimen of *Acontia areli*, James Boone (FMNH, Chicago) for provided us with information on the three syntypes in The Field Museum, and Gracen M. Brilmyer, Division of Insects at The Field Museum, for photographing the three syntypes and their labels. We also thank Jocelyn Gill (CNC, Ottawa, Canada) for assistance with the preparation of the genitalia and photographs. Larry Prevett, Bisbee, Arizona, kindly provided the blank map images in digital format. Christian Schmidt (CNC, Ottawa) and Eric Metzler reviewed the manuscript and provided us with many helpful suggestions.

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